

## REMARKS

Claims 1 - 8 and 10 - 13 are pending in the present Application. No claims have been amended, added or canceled, leaving Claims 1 – 8 and 10 – 13 for consideration upon entry of the present amendment.

### Claims Rejected Under 35 U.S.C. § 102(b)/35 U.S.C. § 103(a)

Claim 13 is rejected under 35 U.S.C. § 102(b) or in the alternative under 35 U.S.C. § 103(a), as allegedly being anticipated by U.S. Patent No. 5,445,327 to Creehan (Office Action dated 10/12/2006, page 4)

The Examiner has stated that

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection. Applicant's argument that Creehan (US 5,445,327) does not teach the melt-blending components is noted, but fail to patentably distinguish their product by process claim over the prior art composition, and the rejection over this prior art is maintained.

(Office Action dated 09-03-08, page 2) The Applicants respectfully disagree.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

In the first instance, Claim 1 is directed to a method. Claim 1 is directed to melt blending a polymeric resin, carbon nanotubes and a plasticizer at a viscosity effective to maintain the ratio of resistivity in the direction parallel to a flow direction to that in the direction perpendicular to the flow direction to be greater than or equal to about 0.15; the carbon nanotubes being present in an amount of about 0.5 wt% to about 5 wt%, based on the total weight of the composition; wherein the melt blending involves heating the polymeric resin to a temperature greater than its glass transition temperature or to a temperature greater than its melting temperature. Claim 13 is directed to an article manufactured by the method of Claim 1.

Claim 1 is directed to melt blending. Melt blending results in a composition that is fused together or monolithic i.e., a unitary object that is indivisible and constitutes a massive undifferentiated and often rigid whole. During the melt blending process, the carbon nanotubes and the polymeric resin are not only homogeneously dispersed so as to achieve a ratio of resistivity in the

direction parallel to a flow direction to that in the direction perpendicular to the flow direction that is greater than or equal to about 0.15, but also form a monolith

Creehan, on the other hand, does not teach melt blending. Creehan instead teaches a compounding process for preparing a composite that includes introducing one or more fillers and a matrix material into a stirred ball mill and subjecting the fillers and the matrix material to a combination of shear and impact forces under reaction conditions including reaction time sufficient to reduce the size of agglomerates formed by the fillers to a value below a pre-determined value to disperse the fillers throughout the matrix material. (see Abstract) Ball mills are used not to accomplish melt blending with the consequent fusion of a plurality of materials into a monolith, but rather to accomplish the opposite, which is to disintegrate materials. The resulting material disclosed by Creehan is a powder that cannot be monolithic.

Creehan teaches the addition of viscosity modifiers (Col. 1, lines 55 – 66), and matrix materials that are in the form of liquids (Col. 2, lines 24 – 26). However, Creehan does not teach melt blending or heating the matrix material above its glass transition temperature as is presently claimed. Creehan's teaching and desire for a powdered material is demonstrated right at the beginning of the "DESCRIPTION OF PREFERRED EMBODIMENTS" in the following paragraph:

Composites are preferably prepared by introducing the matrix material and one or more fillers into a stirred ball mill of the type conventionally used for powder comminution. In the mill, these materials are subjected to both shearing forces due to the stirring action of a mechanical rotor and impact forces due to particulate milling media of the type conventionally used for powder comminution which are added to the mill during stirring; these particulates are removed once the milling operation is over. In the case of metal and ceramic matrices, however, it is not necessary to add separate milling media because the matrices themselves (which are added in the form of powders) are capable of supplying the impact force.

(Col. 3, lines 4 – 17) Further evidence of Creehan's desire to obtain a powdered composition can be witnessed as follows:

In the case of thermoplastic resins, the composites are preferably prepared by introducing the resin and fillers into the stirred ball mill, and then adding dry ice to the mill to cool the contents to a temperature at or near which the resin is transformed into a brittle solid. In this form, the resin is more easily broken up during milling, leading to more uniform dispersions. The dry ice evaporates during milling so that none is retained in the final dispersion.

(Col. 4, lines 2 – 11)

Dry ice turns into a solid at  $-78^{\circ}\text{C}$ , which is far lower than the glass transition temperatures of almost all known organic polymers. Thus, the organic polymers are subjected to shear forces at extremely low temperatures where they are in an embrittled state and consequently undergo comminution as pointed out by Creehan. (Col. 3, lines 4 – 17) In its example (see Table 1), Creehan uses dry ice to embrittle the material. (Col. 4, lines 5 – 8) Creehan thus teaches disintegration by ball milling and not consolidation as would occur during the claimed melt blending process. Creehan, in not teaching melt blending, does not teach all elements of the claimed invention. It therefore cannot anticipate the claimed invention.

With regard to the alternative rejection under 35 U.S.C. § 103(a), it is submitted that there is no motivation to modify Creehan since it does not teach all elements of the claimed invention.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, or knowledge generally available in the art at the time of the invention, must provide some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). “A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). To find obviousness, the Examiner must “identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does.” *Id.*

Creehan not only does not teach all elements of the claimed invention, but in teaching comminution further teaches away from the claimed invention. One of ordinary skill in the art desirous of melt blending the composition would not seek to use a process that disintegrates the matrix resin into a powder by using dry ice. Case law holds that “[O]bviousness can be rebutted by showing that “the prior art teaches away from the claimed invention.” *In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997).

Since Creehan does not teach all elements of the claimed invention and teaches away from the claimed invention, the Applicants believe that the Examiner has not made a prima facie case of obviousness over Creehan. Applicants therefore respectfully request a withdrawal of both the anticipation and the obviousness rejections and an allowance of the claimed invention.

Claim Rejections Under 35 U.S.C. § 102(b) or § 103(a)

Claims 1-5, 7-8 and 10-13 are rejected under 35 U.S.C. 102(e/a) as being anticipated by or under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,469,093 to Koevoets et al. (Koevoets). (Office Action dated 09-02-08, page 3)

In making the rejection, the Examiner has stated:

In the alternative that the disclosure by Koevoets et al be insufficient to anticipate the instant claims, the instant claimed method steps nonetheless would have been obvious to a person of ordinary skilled in the art over the disclosure because the reference teaches each of the claimed ingredients within the structure and a method of making it, and it has the same common utility as conductive plastic. The burden is upon the applicant to prove otherwise. *In re Fitzgerald*, 61 9 F.2d 67, 205 USPQ594 (CCPA 1980).

(Office Action dated 09-02-08, page 4) The Examiner has stated that Koevoets teaches a high viscosity poly(arylene ether) and a low viscosity poly(arylene ether) in combination. (see Office action page 3 and see Col. 3, lines 18 – 24 of Koevoets) The Applicants respectfully disagree.

Koevoets teaches a composition that comprises about 10 weight percent (wt. %) to about 50 wt. % polyphenylene ether, about 35 wt. % to about 65 wt. % polyamide, about 5 wt. % to about 40 wt. % talc, and about 0.4 wt. % to about 3.0 wt. % carbon. (See Col. 1, lines 54 - 59) Koevoets teaching of the use of 5 to 40 wt% talc would render it impossible to produce the properties of the claimed composition.

Koevoets teaches a number of different processing steps that can be used to manufacture the composition. Each of these processing steps are enumerated, discussed, and discounted below.

Koevoets first teaches:

The preparation of the thermoplastic compositions can normally be achieved by merely blending the ingredients under conditions for the formation of an intimate blend. Such conditions often include mixing in single or twin screw type extruders or similar mixing devices which can apply a shear to the components.

(Col. 9, lines 42 – 47) The mere blending of a composition comprising 10 weight percent (wt. %) to about 50 wt. % polyphenylene ether, about 35 wt. % to about 65 wt. % polyamide, about 5 wt. % to about 40 wt. % talc, and about 0.4 wt. % to about 3.0 wt. % carbon would not produce the claimed properties because the addition of such large amounts of talc would mitigate any viscosity reduction

brought on by mixing a high viscosity polymer with a low viscosity polymer.

In the claimed invention, the addition of the plasticizer facilitates a reduction in processing viscosity. The decrease in the processing viscosity leads to a reduced amount of shear during the melt blending, which in turn preserves the aspect ratio (aspect ratio = length divided by diameter) of the carbon nanotubes. Preservation of the aspect ratio leads to improved conductivity as well as to a more uniform distribution of electrical conductivity in the samples as can be seen in the Examples of the present invention.

The Examiner has stated that Koevoets teaches a high viscosity poly(arylene ether) and a low viscosity poly(arylene ether) in combination. (see Office action page 3 and see Col. 3, lines 18 – 24 of Koevoets) The Applicants submit that while Koevoets teaches blending high viscosity and low viscosity poly(arylene ethers), it also teaches the addition of large quantities of talc, which would drastically increase the melt viscosity of the molten polymer. Koevoets in teaching the use of talc teaches away from the claimed invention, since the use of talc would increase the melt viscosity and would facilitate the cleavage of the carbon nanotubes (with a consequent reduction in the aspect ratio of the carbon nanotubes) during extrusion, which would in turn increase the melt viscosity.

That Koevoets had no understanding of the synergy between lowering the viscosity of the molten resin with the preservation of aspect ratio of the carbon nanotubes can be seen in its discussion of processing of the composition, which is as follows:

All of the ingredients may be added initially to the processing system, or else certain additives may be precompounded with one or more of the primary components, preferably the polyphenylene ether, impact modifier and the polyamide. A masterbatch of talc can be made with polyamide, at a ratio of about 5 wt. % to 50 wt. % talc, balance polyamide possible, with a ratio of about 40% to about 50% talc, balance polyamide preferred. Similarly, fibrils are also preferably part of a masterbatch with polyamide. The fibril ratio can be about 10% to about 30% fibrils, with about 15% to about 25% fibrils, balance polyamide preferred. The level of filler in a masterbatch is usually limited by a number of factors like, wetting behavior of filler by carrier polymer, viscosity increase of carrier polymer due to filler loading, etc.

(Col. 9, lines 48 – 63) Koevoet's teaching of the simultaneous addition of the viscosity-increasing talc masterbatch with the carbon fiber masterbatch to the processing device would have the effect of increasing the viscosity thus promoting increased shear and reduced aspect ratios for the carbon nanotubes. Koevoets, in teaching the use of such a large quantity of talc, teaches away reducing the

melt viscosity, and one of ordinary skill in the art upon reading Koevoets would not have been appraised of the importance of reducing melt viscosity to improve electrical conductivity of the composition.

In addition, Koevoets teaches

For example, the thermoplastic composition can be made by compounding polyphenylene ether and a compatibilizer in an extruder, while maintaining the extruder at a sufficient temperature to melt the polyphenylene ether. The polyamide, a carbon masterbatch, and optionally the talc (or a filler) masterbatch can then be introduced to the extruder at a downstream port. The compounded mixture, polyamide, carbon masterbatch and talc masterbatch are then mixed to form the thermoplastic composition. The composition can be formed into pellets, sheets, film, coating, various components, or the like.

(Col. 9, line 65 – Col. 19, line 9) Here too, Koevoets teaches that the polyphenylene ether is concurrently mixed with the talc masterbatch and the carbon fibril masterbatch, thereby increasing the melt viscosity and reducing the aspect ratio.

Koevoets further teaches that

Alternatively, the polyphenylene ether, compatibilizer and talc can be added to the extruder with a portion of the polyamide (e.g. up to about 10 wt. % of the polyamide). These components can then be compounded prior to introducing the remainder of the polyamide and a carbon/polyamide masterbatch. Again, the compounded mixture, polyamide, and carbon masterbatch can then be mixed to form the thermoplastic composition.

(Col. 10, line 10 – Col. 10, line 18) Koevoets in teaching that the talc is first added to the extruder followed by the carbon masterbatch teaches that the carbon nanotubes would be added to a high viscosity composition, which as noted above would only serve to increase the shear experienced by the carbon nanotubes, which in turn would decrease the aspect ratio and reduce homogeneity. Koevoets thus did not know or understand the synergistic relationship between viscosity and electrical conductivity. One of ordinary skill in the art following Koevoets teachings would not be able to produce the claimed composition.

Further evidence of this lack of understanding of the synergistic relationship between viscosity and electrical conductivity is evident from the Example of Koevoets. In its examples, Koevoets chose to use only the low intrinsic viscosity polyamide for all of its samples. (see Examples A – I of the

Table in Col. 11; see also the description in Col. 10, lines 60 – 67 where only a low IV polyamide is prescribed). Had Koevoets understood the nature of the synergy between viscosity and electrical conductivity, it would have in its examples, demonstrated using a high viscosity polyamide (first blended with the carbon nanotubes) followed by the addition of a low viscosity polyamide to facilitate the preservation of the aspect ratio of the carbon nanotubes. Further evidence of the fact that Koevoets did not understand this synergistic relationship can be witnessed by the fact that even its examples, Koevoets first added the talc masterbatch followed by the addition of the carbon masterbatch. (see Col. 10, lines 60 – 67) This would cause a degradation of the aspect ratio of the carbon nanotubes.

Thus, while Koevoets teaches all chemical elements of the claimed invention, it does not anticipate the claimed composition (in terms of properties because of the addition of talc) nor does it render the claimed composition inherent. Because of the amount of talc and other fillers that Koevoets prescribes, the claimed requirement of a “ratio of resistivity in the direction parallel to a flow direction to that in the direction perpendicular to the flow direction being greater than or equal to about 0.15” would never be met.

In addition, one of ordinary skill in the art would find no motivation to modify Koevoets by removing the talc. Koevoets teaches and desires certain impact properties for its compositions. (see Col. 10, lines 19 – 20) In removing the talc, one of ordinary skill in the art would be changing the operative function of the compositions as prescribed by Koevoets. In this regard, the courts have held that “[i]f the proposed modification would render the prior art invention being modified unsatisfactorily for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon* 733 F. 2d 900, 221 USPQ 1125 (Fed. Cir. 1984). The courts have also held that “[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious.” *In re Ratti* 270 F. 2d 810, 123 USPQ 349 (CCPA 1959).

Finally there would be no expectation of success. With regard to the alternative rejection under 35 U.S.C. § 103(a), one of ordinary skill in the art upon reading Koevoets would not be appraised of the synergistic results obtained with the aspect ratio of the carbon nanotubes and the lowered viscosity of the polymeric resin. Koevoets does not disclose any effect of the lowered

viscosity on the dispersion of the filler. This has been acknowledged by the Examiner. (Office Action dated 09-02-08, page 4, last paragraph) Even where Koevoets experiments with carbon fibrils(e.g., see Examples A - I), it does not describe the preservation of aspect ratio, which in turn leads to the claimed property of a resistivity ratio of greater than or equal to about 0.15. In addition, there is no indication that the reduced viscosity described by Koevoets would be adequate to preserve the aspect ratio in the carbon fibrils described in Koevoets because of the simultaneous addition of the talc and other fillers.

One of ordinary skill in the art would thus not be appraised as to any expectation of success upon reading Koevoets. As can be seen in the Examples 1 and 2 of the present application, the addition of a low viscosity additive not only produces lower levels of electrical resistivity, but also homogenizes the electrical resistivity across the length and breadth of the composition. This result is unexpected. In this regard, the courts have held that “[A]n applicant can rebut a prima facie case of obviousness by presenting comparative test data showing that the claimed invention possesses unexpectedly improved properties or properties that the prior art does not have.” *In re Dillon*, 919 F.2d 688, 692-93, 16 U.S.P.Q.2d 1987, 1901 (Fed. Cir. 1990).

Thus since Koevoets would not produce the claimed properties, provides no motivation to modify it and provides no expectation of success, the Applicants believe that the Examiner has not made a prima facie case of obviousness over Koevoets. The Applicants respectfully request a withdrawal of the anticipation rejection and the obviousness rejection over Koevoets.

Claims 1-5, 7-8 and 10-13 are rejected under 35 U.S.C. 102(e/a) as being anticipated by or under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,643,502 to Nahass et al. (Nahass). (Office Action dated 09-02-08, page 4)

In making the rejection, the Examiner has stated that

Nahaas et al teach a method of making a conductive polymer by forming a master-batch comprising low viscosity polycarbonate (plasticizer) and a pelletized product formed by melt kneading PC, polybutadiene and styrene acrylonitrile to provide 2%- CF, 69%-PC and 29%-ABS by melt extruding the composition. Applicants define a plasticizer is a low molecular weight organic or inorganic species, which can facilitate a reduction in melt viscosity during the blending of the polymeric resin with the carbon nanotubes (Spec. Pg-12, P-0038) and low viscosity PC meets this limitation.

(Office Action dated 09-02-08, page 5) The Applicants respectfully disagree.

Nahass teaches a polymeric composition having improved toughness and conductivity comprising carbon fibrils. (see Abstract) Nahass teaches a conductive, static-dissipative or anti-static polymeric composition having acceptable toughness may be prepared by combining 0.25 - 50 wt % of carbon fibrils with one or more selected polymeric materials. (See Col. 3, lines 25 - 28) The combination is mixed to distribute the fibrils, at least a portion of which are in the form of aggregates, in the polymeric material. (See Col. 3, lines 28 - 30) Shear is applied to the combination to break down the aggregates until as measured on an area basis, substantially all of the aggregates are less than 35 micrometers in diameter. (See Col. 3, lines 30 - 33)

Nahass teaches letting down a masterbatch by using a polymer that has a lower melt viscosity than that of the masterbatch. (See Col. 7, lines 50 - 62; see also Figure 1) Nahass does not teach using a plasticizer that has a lower melt viscosity than that of the polymer itself as described in the specification of the present application. (see paragraph [0038] of the instant application; see also Example 1 of the present application, where a high melt viscosity polycarbonate is mixed with a lower melt viscosity polycarbonate) In other words, the plasticizer of the claimed invention has the ability to lower the viscosity of the matrix polymer itself, not just the viscosity of the masterbatch that contains the carbon nanotubes.

While the Examiner has alleged that Nahass teaches a plasticizer, this is inaccurate. The specification of Nahass does not teach using a lower molecular weight polymer than the polymer employed in the masterbatch. Even in its examples, Nahass always uses a polymer having the same molecular weight as the polymer used in the masterbatch. Thus the viscosity reduction encountered in Nahass is only that due to the dilution of the masterbatch. This kind of viscosity reduction would not produce any homogenization of electrical properties as presently claimed. Thus, Nahass does not teach all elements of the claimed invention. Nahass therefore cannot anticipate the claimed invention.

In addition, Nahass teaches 0.25 to 50 wt% carbon fibrils. The synergistic effect presently claimed can generally be seen only in the percolation range of the electrical conductivity curve for a given polymer. The examples of the present invention show that this effect (i.e., the percolation range) exists only in a limited range of carbon nanotube concentration that is generally less than 5 wt%, based on the weight of the composition. This will be explained in greater detail for the

Examiner's edification below. Nahass therefore does not teach the carbon fibril content with any degree of specificity to anticipate the claimed composition.

In this regard, the courts have held that "[A] reference must provide a disclosure with "sufficient specificity" to constitute a description of the claimed composition within the purview of 35 U.S.C. § 102(b)." *See In re Schaumann*, 572 F.2d 312, 315, 197 USPQ 5, 8 (CCPA 1978).

Applicants therefore respectfully request a withdrawal of the anticipation rejection against Claims 1-5, 7-8 and 10-13, because Nahass does not teach all elements of the claimed invention and because it lacks sufficient specificity to constitute a description of the claimed product within the purview of 35 U.S.C. § 102(b).

With regard to the alternative rejection under 35 U.S.C. § 103(a), one of ordinary skill in the art upon reading Nahass would not be appraised of the synergistic results obtained because of the relationship between the aspect ratio of the carbon nanotubes and the lowered viscosity of the polymeric resin. Nahass does not disclose any effect of the lowered viscosity on the dispersion of the filler. Even where Nahass experiments with the carbon nanotubes (e.g., Examples I - VI), it does not describe the preservation of aspect ratio. As noted above, preservation of the aspect ratio leads to the claimed property of a resistivity ratio that is greater than or equal to about 0.15. In addition, there is no indication that the reduced viscosity described by Nahass would be adequate to preserve the aspect ratio in the glass fibers described in Nahass, since the melt viscosity of the let down polymer is no different than the melt viscosity of the polymer used in the masterbatch.

Since Nahass does not teach a synergy between the low viscosity and the preservation of aspect ratio of carbon nanotubes, one of ordinary skill in the art upon reading Nahass would not be motivated to try the plasticizers as presently claimed. In addition, since Nahass provides no guidance as to the quantity of conductive filler required to produce an electrically conductive composition, one of ordinary skill would not be able to estimate the amount of carbon nanotubes that must be used in order to arrive at the claimed properties.

Finally, the synergistic effect disclosed in the examples of the present application, exists only at a certain range of weight percentages of the carbon nanotubes, based on the total weight of the composition. The weight percent range for the carbon nanotubes disclosed by Nahass i.e., 0.25 to 50 wt% is so large, that it would not display the claimed synergistic effect for most of the range.

At very low weight percentages of carbon nanotubes, the composition does not display any electrical conductivity, since there is no connectivity between the carbon nanotubes. At very high percentages, there is no synergy between the viscosity reducing additive and the carbon nanotubes since there the weight percent of carbon nanotubes is large enough to mitigate the effects of a better dispersion and the preservation of aspect ratios.

This can be seen in the Figures 5 and 7 of the present application. As can be seen in the Figure 5, when 3 wt% carbon nanotubes are added to the composition (with and without the diluent), the electrical conductivity displayed by the respective compositions is almost identical. Similarly, in the Figure 7, the compositions containing the high and low molecular weight nylon (with the addition of the calcium stearate) show identical electrical conductivity when 3 wt% of carbon nanotubes are added to the composition.

While the compositions that contained water in the Figure 7 display divergent electrical conductivities, it is expected that these too would display identical electrical conductivity as the amount of the carbon nanotubes was increased beyond 3 wt%.

Applicants would like to draw the Examiner's attention to Figures 1 and 2 of Appendix A. These figures relate to Percolation Theory, which is used to explain the relationship between the connectedness of clusters of an electrically conducting filler dispersed in an electrically insulating matrix and the measured electrical conductivity of the resulting composition. The Figures 1 and 2 relate to Example 4 of the present application.

Figure 1 of Appendix A, shows exemplary depictions (1) through (6) of a section of an insulating polymeric resin as increasing quantities of an electrically conducting filler are dispersed in the polymeric resin. Figure 1 depicts a section of the insulating polymeric resin without any filler. Since the polymeric resin does not contain any electrically conducting filler, the electrical resistivity measured across the surface MN and the surface OP is very high as depicted by the location of point (1) on the curve in the Figure 2.

Depiction (2) of Figure 1 shows the electrical conductivity of the composite when a small amount of an electrically conducting filler is dispersed in the polymeric resin. Since the clusters of the electrically conducting fillers do not contact each other, there is still no electrical conductivity measured across the surface MN and the surface OP. This is because the amount of the electrically conducting filler is small enough to not form a percolating network across the depicted section. A

percolating network is one where there is at least one continuous electrical filler network that contacts the surfaces MN and OP of the section of the composite. This electrically insulating behavior demonstrated by the composite is depicted by portion (1)-(2) of the curve in the Figure 2. The portion (1)-(2) of the curve in the Figure 2 is a plateau whose value in ohm-centimeters would be equal to that of the polymeric resin.

As more electrically conductive filler is added to the composite, the amount of filler reaches the percolation threshold, a percolating network is formed, and the composite now begins to show electrical conductivity as indicated by the depiction (3) in Figures 1 and 2 respectively. With regard to the Figure 2, at location (3) (also indicated by line XX') there is an increase in electrical conductivity measured across the surfaces MN and OP. With the increase in filler content, there is a further increase in electrical conductivity as seen by the depiction (4) in the Figure 1 and the corresponding location of (4) (also indicated by the line YY') in the Figure 2. This increase in electrical conductivity is represented by the dotted line between the lines XX' and YY'.

With further increases in the filler content as seen in the depiction (5) of Figure 1, there is only a very modest increase in the electrical conductivity of the composite as seen by the location of (5) in the Figure 2. Additional increases in the filler content as witnessed by the depiction (6) in Figure 1 do not result in further increases in electrical conductivity as seen by the location of (6) in the Figure 2. Thus, once a steady state of electrical conductivity is reached as witnessed by the point (5) on the percolation curve, the further addition of electrically conducting filler does not produce further increases in the electrical conductivity in the composite. The portion (5)-(6) of the curve in the Figure 2 is also a plateau whose conductivity in ohm-centimeters would be approximately equal to the conductivity of the electrically conductive filler added to the polymeric resin.

Thus, Nahass in teaching a large range (i.e., 0.35 to 50 wt%) does not teach an effective amount of carbon nanotubes where the synergy between viscosity and electrical conductivity can be observed. Nahass therefore does not teach the invention with any degree of specificity. Nahass therefore cannot anticipate the claimed invention, or in the alternative, render the invention obvious. Applicants believe that the Examiner has not made a prima facie case of obviousness over Nahass and therefore respectfully request a withdrawal of the rejection and an allowance of the claimed invention.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Koevoets or

over Nahass in view of U.S. Patent No. 6,384,128 to Wadahara et al. (Wadahara) (Office Action dated 09-02-08, page 5) The Applicants respectfully disagree.

Claim 6 is dependent from Claim 1. Claim 6 is directed to the addition of other electrically conductive fillers to the composition. These electrically conductive fillers are carbon black, conductive metallic fillers, solid non-metallic, conductive fillers, or combinations comprising at least one of the foregoing electrically conductive fillers.

As noted above, neither Koevoets nor Nahass teaches all elements of the claimed invention. More specifically, neither Koevoets nor Nahass teach the synergistic relationship between viscosity and the electrical conductivity of the composition. As noted above, Koevoets in fact teaches away from this synergy by prescribing a large amount of talc that can be used as a filler.

Wadahara is directed to flame retardant thermoplastic compositions. (see Abstract) Wadahara too does not teach any synergistic relationship between viscosity and the electrical conductivity for a composition containing carbon nanotubes. For this reason at least, Wadahara does not correct for the deficiencies of Koevoets or Nahass. The Applicants therefore believe that the Examiner has not made a case of obviousness over Koevoets or Nahass in view of Wadahara. The Applicants respectfully request a withdrawal of the obviousness rejection over Koevoets or Nahass in view of Wadahara.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the rejections and allowance of the case are respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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